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ABSTRACT

An etching process for manufacturing deep trenches in silicon layers of semiconductor devices and the resulting structures is described. The etching process makes the trenches using a chlorine-based chemical as the primary etchant, while employing various additives to obtain the desired trench surface conditions, geometry, shape, and uniformity. The etching process obtains the trenches in a single step, decreasing the cost and time for manufacturing. In the future, as requirements for IC components (i.e., capacitors and deep isolation trenches) using trenches become more restrictive, the method and structures of present invention could become an integral part of trench technology.